

19. On all models except ATC70, remove the bolts (Figure 10) securing the engine hanger and remove the engine hanger.

20. Remove the nuts and washers from the upper and lower engine mounting through bolts (Figure 11). Withdraw the bolts from the left-hand side.

21. Pull the engine slightly forward and lower the engine from the frame. Take it to a workbench for further disassembly.

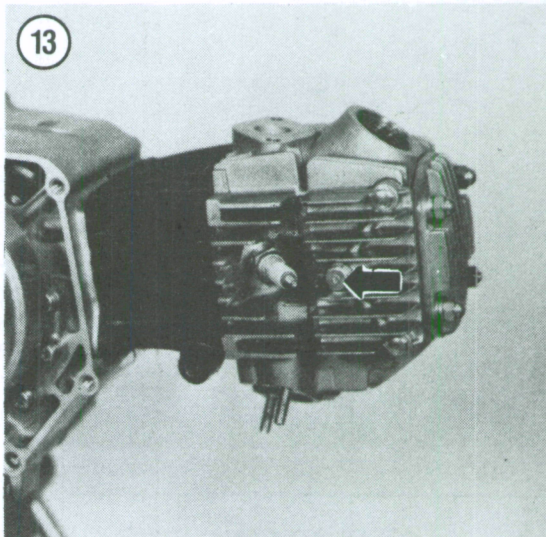
22. Install by reversing these removal steps, noting the following.

23. Tighten the mounting bolts to the torque specifications in Table 2.

24. Fill the engine with the recommended type and quantity of oil; refer to Chapter Three.

25. Adjust the clutch, drive chain and rear brake pedal as described in Chapter Three.

26. Start the engine and check for leaks.



## CYLINDER HEAD AND CAMSHAFT

### Removal (70 cc)

This procedure is shown with the engine removed from the frame. It is not necessary to remove the engine to perform this procedure. Refer to Figure 12 for this procedure.

#### CAUTION

*To prevent any warpage and damage, remove the cylinder head and cam only when the engine is at room temperature.*

1. Place the ATC on level ground and set the parking brake or block the wheels so the vehicle will not roll in either direction.

2. Remove the seat/rear fender assembly.

3. Shift the transmission into NEUTRAL.

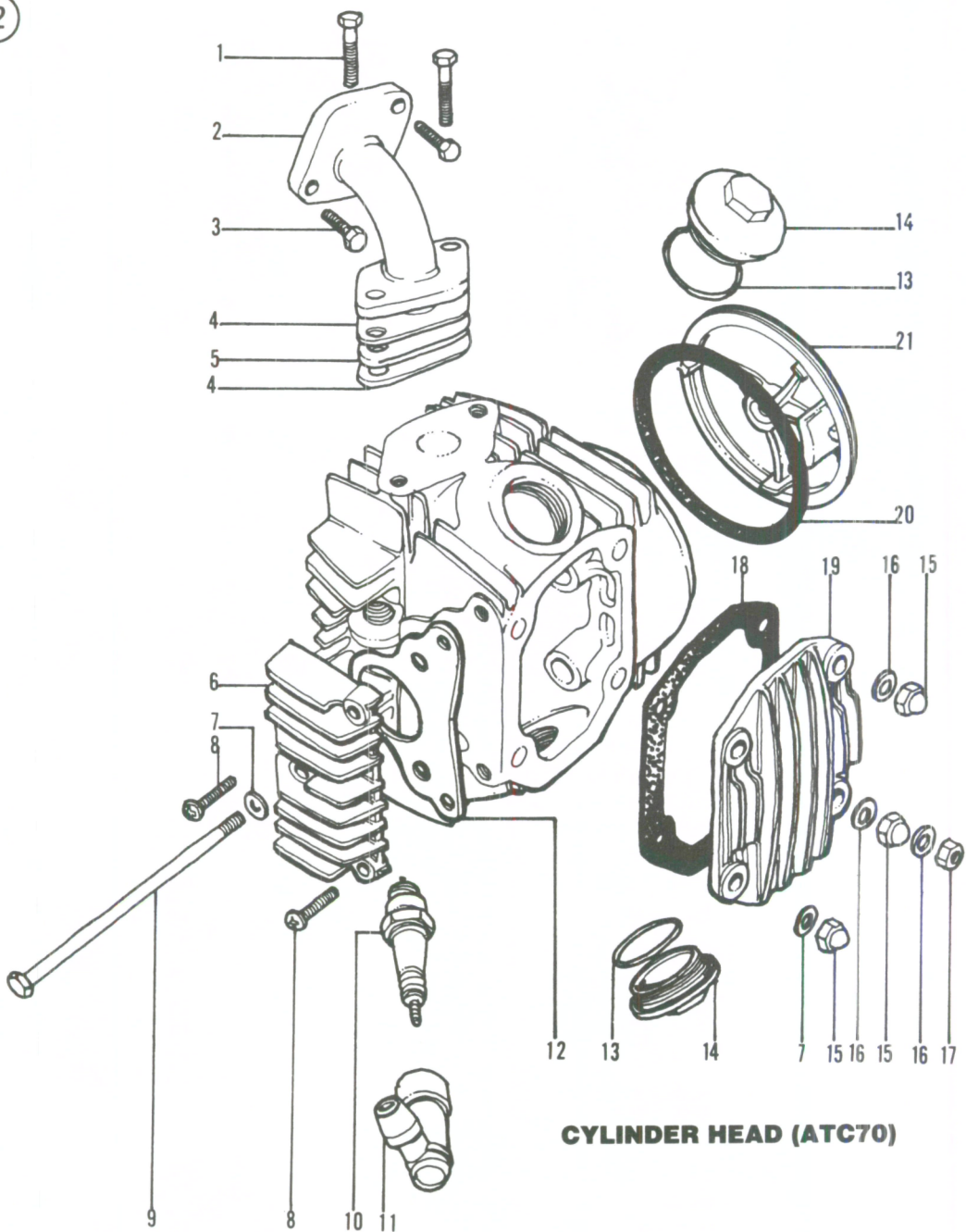
4. Remove the fuel tank as described in Chapter Six.

5. On the right-hand side of the engine, loosen the bolt (Figure 13) securing the side cover. Tap the bolt with a plastic mallet to help break loose the left-hand side cover. Remove the bolt and remove both side covers and the gasket (Figure 14).

6. Remove the screw (Figure 15) securing the cylinder head to the cylinder.

7. Remove the bolts (Figure 16) securing the cam sprocket. Insert a screwdriver or drift into the hole in the cam and cam sprocket to keep the sprocket and chain from sliding into the cam chain cavity on the side of the cylinder.

12



**CYLINDER HEAD (ATC70)**

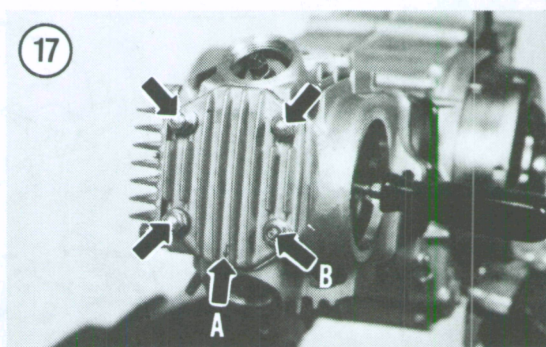
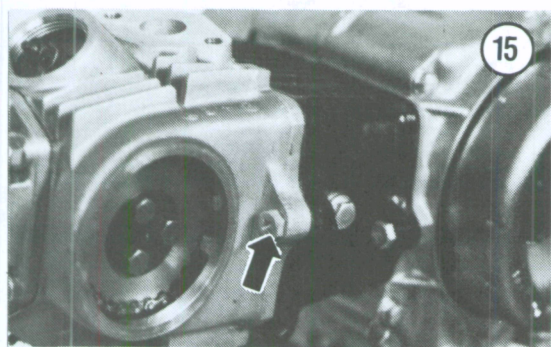
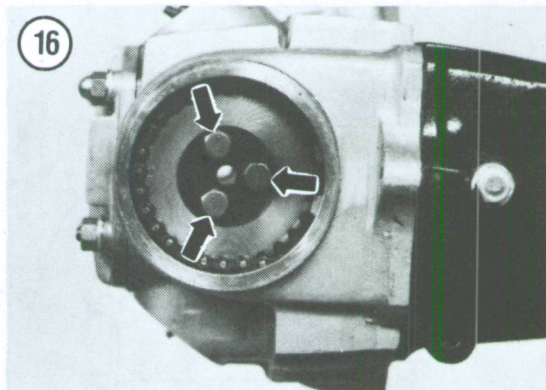
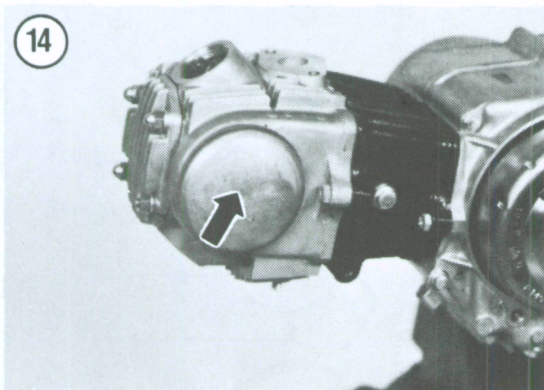
- 1. Bolt
- 2. Intake manifold
- 3. Bolt
- 4. Gasket
- 5. Insulator
- 6. Cover

- 7. Washer
- 8. Screw
- 9. Bolt
- 10. Spark plug
- 11. Cap

- 12. Gasket
- 13. O-ring
- 14. Cap
- 15. Nut
- 16. Washer

- 17. Nut
- 18. Gasket
- 19. Cover
- 20. Gasket
- 21. Cover





8. In a crisscross pattern, remove the nuts and washers (Figure 17) securing the cylinder head cover and remove the cover and the gasket.

9. Loosen the head by tapping around the perimeter with a rubber or plastic mallet. If necessary, gently pry the head loose with a broad-tipped screwdriver.

#### CAUTION

*Remember, the cooling fins are fragile and may be damaged if tapped or pried on too hard. Never use a metal hammer.*

10. Remove the screwdriver (A, Figure 18) or drift from the cam sprocket and remove the cam sprocket.

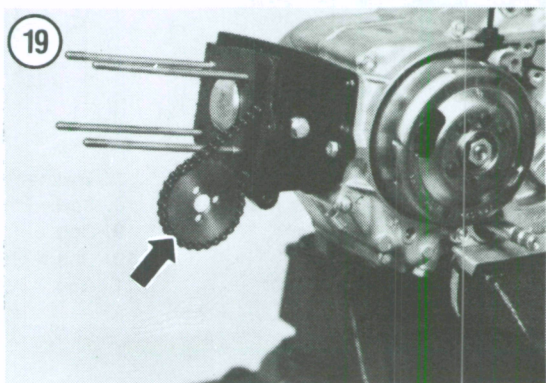
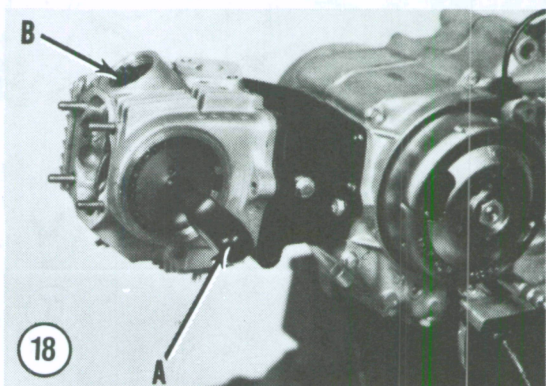
11. Pull the cylinder head and gasket (B, Figure 18) straight off the crankcase studs.

12. After the cylinder head is removed, reinstall the cam sprocket onto the cam chain to hold the chain in position (Figure 19).

13. Remove the cylinder head gasket and discard it. Don't lose any locating dowels.

14. Place a clean shop cloth into the cam chain opening in the cylinder to prevent the entry of foreign matter.

15. Remove the cam from the cylinder head (Figure 20).





**Removal (90-125 cc)**

Refer to **Figure 21** (ATC90 and 1979-1980 ATC110) or **Figure 22** (1981-on ATC110 and all ATC125M) for this procedure.

Damage to the valves and cylinder head can be caused by over-revving the engine on 1981-1984 ATC110 and 1984 ATC125M models. To eliminate this problem, Honda has developed a new CDI unit with a built-in rpm limiter. Some early ATC110 models that have experienced this problem will also benefit from the installation of a new valve set that consists of new valves, valve keepers and valve spring collars.

If your ATC is still covered by the factory warranty, take it to a Honda dealer and have this

engine modification performed under the conditions of your warranty. If your ATC is out of the warranty period, this modification should still be performed to eliminate the possibility of engine damage.

All ATCs that have the new parts installed are identified by an "X" mark stamped directly under the engine serial number on the crankcase.

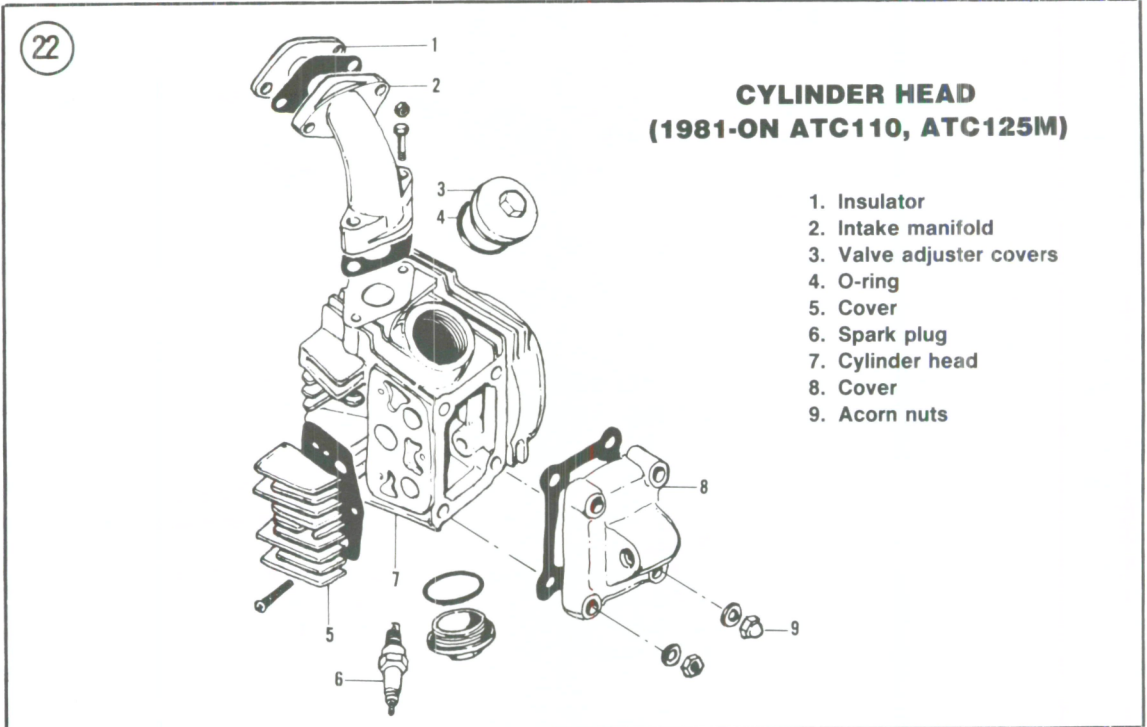
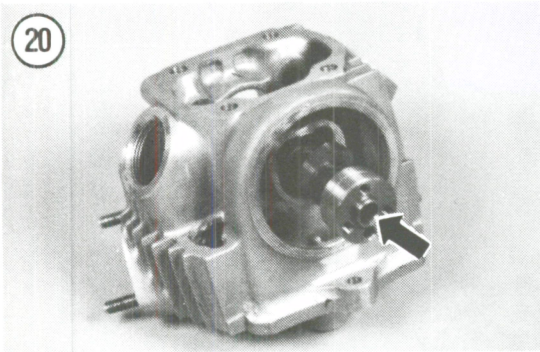
The models that are affected by this problem are as follows:

- a. 1981-1983 ATC110: All models (CDI unit and valve set).
- b. 1984 ATC110: Engine serial No. 2600001-2607160 inclusive (CDI unit and valve set).
- c. 1984 ATC110: Engine serial No. 2607161-on (CDI unit only).
- d. 1984 ATC125M: All models (CDI unit only).

**CAUTION**

*To prevent any warpage and damage, remove the cylinder head and cam only when the engine is at room temperature.*

1. Place the ATC on level ground and set the parking brake.
2. Remove the seat/rear fender assembly.
3. Remove the fuel tank as described in Chapter Six.

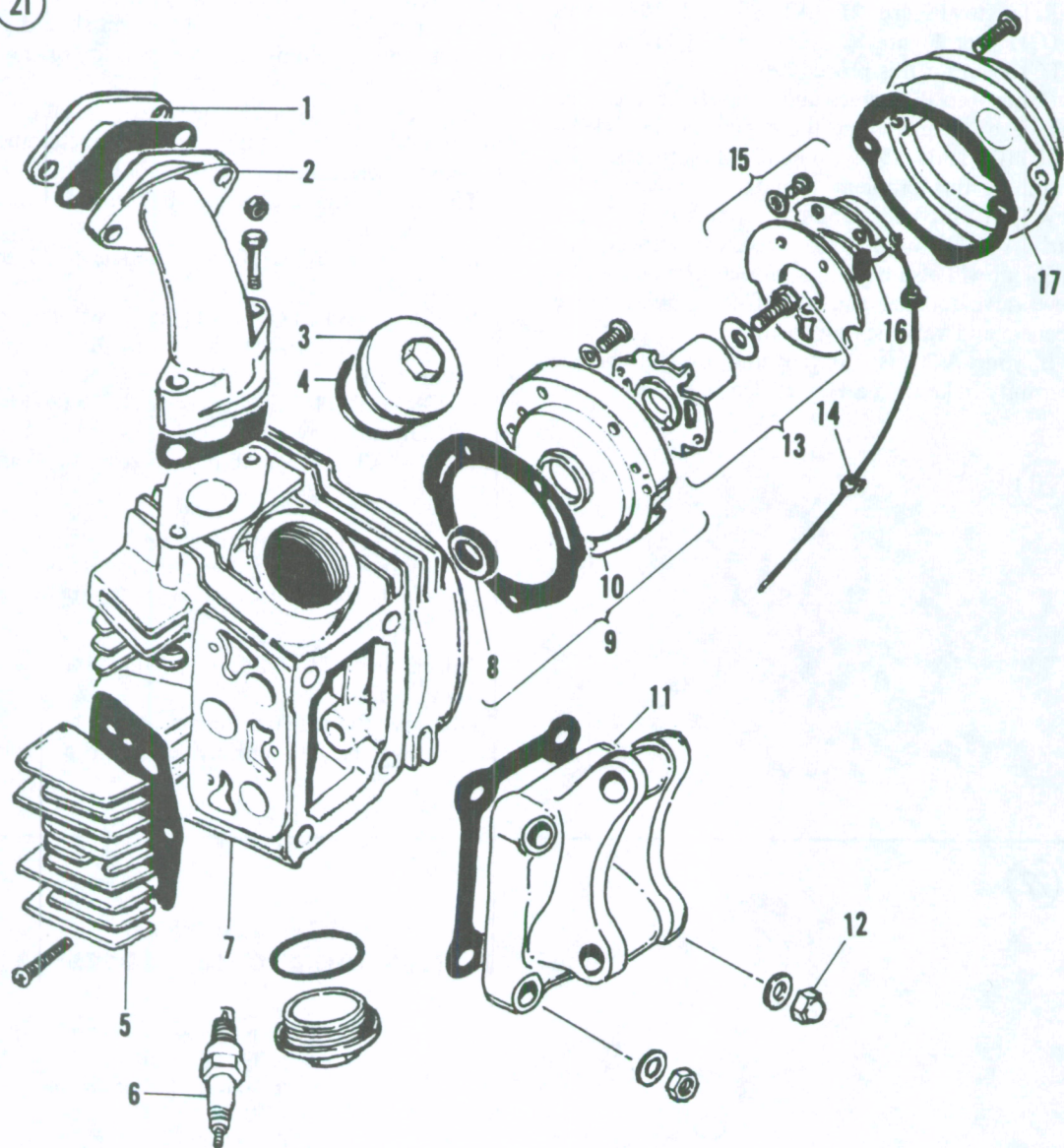


**CYLINDER HEAD  
(1981-ON ATC110, ATC125M)**

1. Insulator
2. Intake manifold
3. Valve adjuster covers
4. O-ring
5. Cover
6. Spark plug
7. Cylinder head
8. Cover
9. Acorn nuts



21



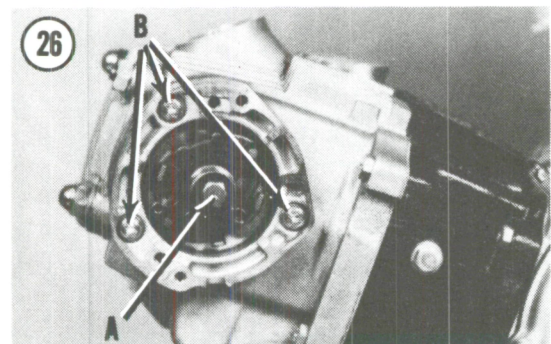
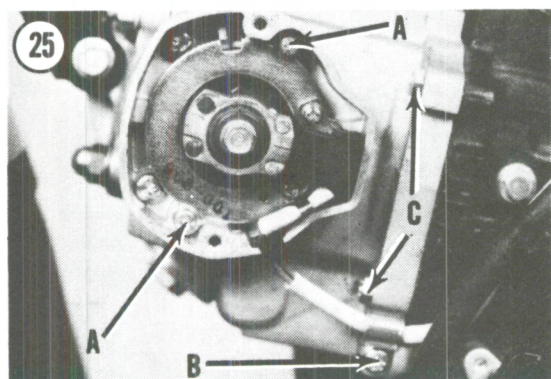
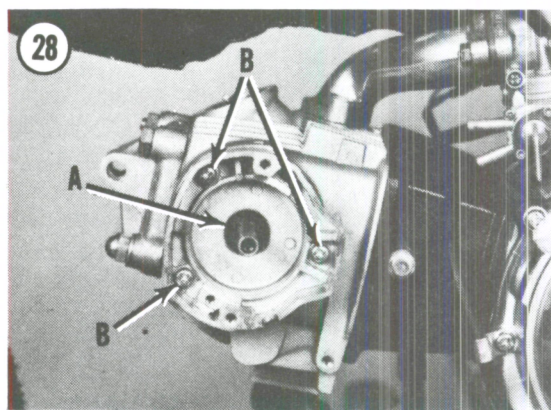
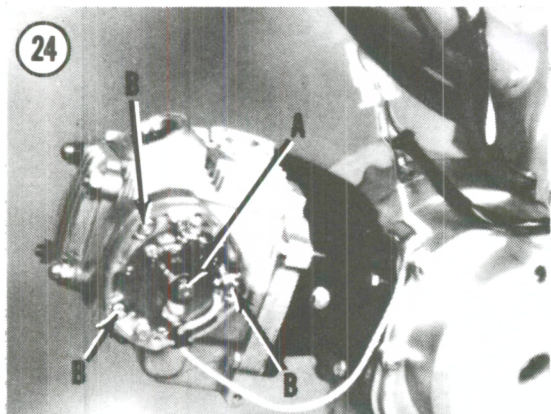
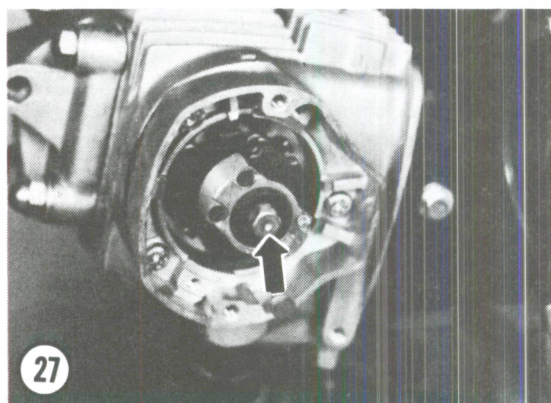
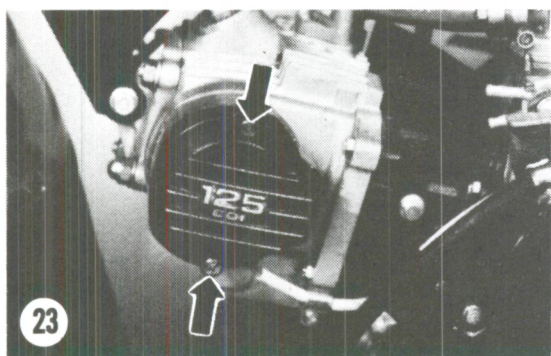
**CYLINDER HEAD  
(ALL ATC90, 1979-1980 ATC110)**

- 1. Insulator
- 2. Intake manifold
- 3. Tappet cover
- 4. O-ring
- 5. Cover
- 6. Spark plug

- 7. Cylinder head
- 8. Spacer
- 9. Point base assembly
- 10. Point base
- 11. Cover
- 12. Acorn nut

- 13. Ignition advance assembly
- 14. Clip
- 15. Breaker point assembly
- 16. Breaker points
- 17. Breaker point assembly cover





4. Remove the carburetor and intake tube as described in Chapter Six.

5. Remove the screws (Figure 23) securing the ignition cover and remove the cover and the gasket.

6. Disconnect the electrical connector to the contact breaker point assembly (A, Figure 24) or CDI pulse generator assembly.

7A. On breaker point ignition models, remove the screws securing the contact breaker point assembly and base plate (B, Figure 24). Remove the assembly.

7B. On CDI ignition models, remove the screws (A, Figure 25) securing the CDI pulse generator assembly. Remove the screw and clamp (B, Figure 25) securing the electrical wires to the cylinder head and remove the assembly.

8A. On breaker point ignition models, remove the bolt (A, Figure 26) securing the ignition advance mechanism and remove the mechanism.

8B. On CDI ignition models, remove the bolt (Figure 27) securing the pulse rotor and ignition advance mechanism and remove the mechanism.

9. Remove the dowel pin on the camshaft (A, Figure 28).



10A. On breaker point ignition models, remove the bolts (B, **Figure 26**) securing the contact breaker point base and remove the base.

10B. On models with a CDI ignition, remove the screws (B, **Figure 28**) securing the pulse generator base and remove the base.

11. Rotate the crankshaft with the recoil starter until the camshaft sprocket "O" timing mark aligns with the index mark on the cylinder head (A, **Figure 29**).

12. Loosen the cam chain tensioner locknut and adjust bolt.

13. Remove both cam sprocket bolts (B, **Figure 29**). Hold the cam chain sprocket with one finger and withdraw the camshaft (**Figure 30**).

#### NOTE

*Prior to removing the nuts and washers, note the location of the copper washer(s) and cap nut(s). The location varies with different models and years. They must be installed on the same crankcase stud from which they were removed. If installed incorrectly, an oil leak will result.*

14. Using a crisscross pattern, remove the nuts and washers (**Figure 31**) securing the cylinder head cover.

15. Remove the cylinder head cover and gasket.

16. On ATC125M models, remove the screws (C, **Figure 25**) securing the cylinder head to the cylinder.

17. Loosen the head by tapping around the perimeter with a rubber or plastic mallet. If necessary, gently pry the head loose with a broad-tipped screwdriver.

#### CAUTION

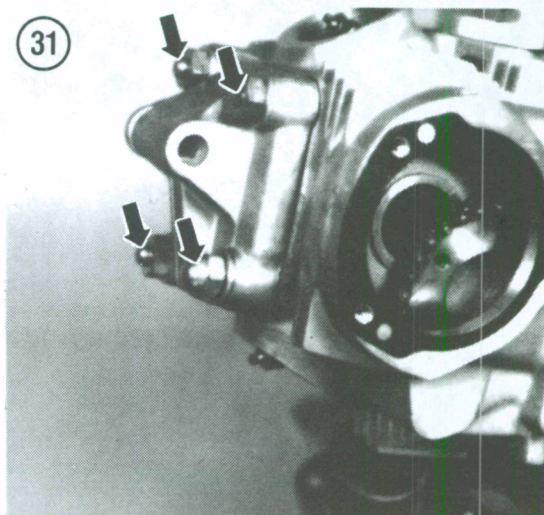
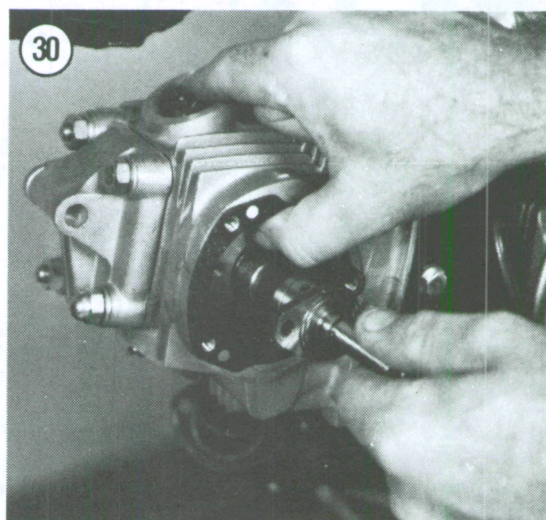
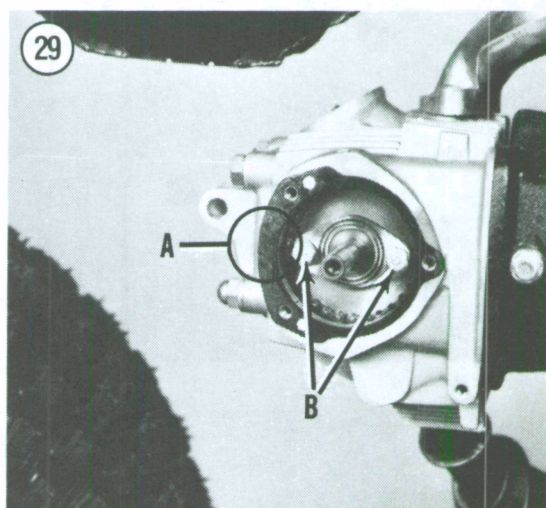
*Remember the cooling fins are fragile and may be damaged if tapped or pried on too hard. Never use a metal hammer.*

18. Remove the cam sprocket and pull the cylinder head and gasket straight off the crankcase studs.

19. After the cylinder head is removed, reinstall the cam sprocket onto the cam chain to hold the chain in position.

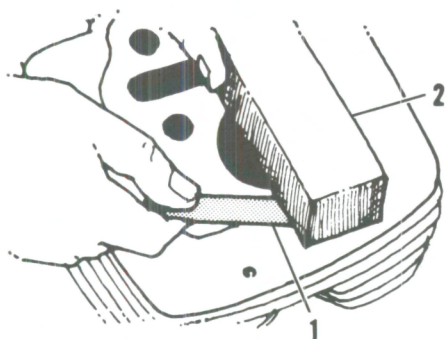
20. Remove the cylinder head gasket and discard it. Don't lose any locating dowels.

21. Place a clean shop cloth into the cam chain opening in the cylinder to prevent the entry of foreign matter.



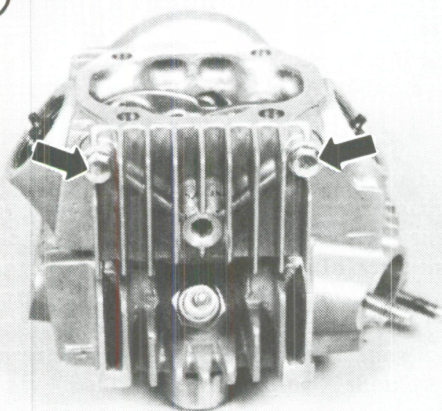


32



1. Feeler gauge  
2. Straightedge

33



#### Disassembly/Inspection/Assembly (All Models)

It is recommended that one rocker arm assembly be disassembled, inspected and then assembled to avoid the interchanging of parts. This is especially true on a well run-in (high mileage) engine as the parts have developed wear patterns.

The cylinder head shown in this procedure is from an ATC70. There are slight differences

between this cylinder head and the type used on 90-125 cc engines. Where differences occur they are identified.

Because the cylinder head and cover are machined as a set during manufacture, they must be replaced as a set if either is damaged or defective.

#### NOTE

*Honda does not provide service limit specifications for all components on all models. The specifications given in Table 1 are the only ones given by the manufacturer.*

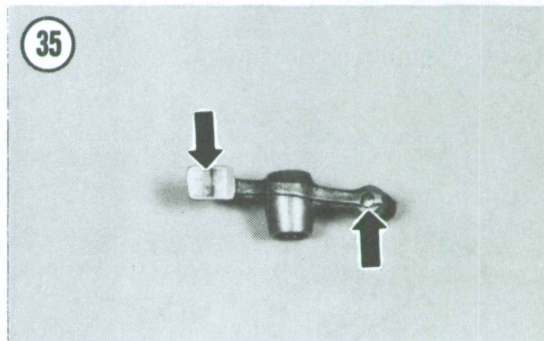
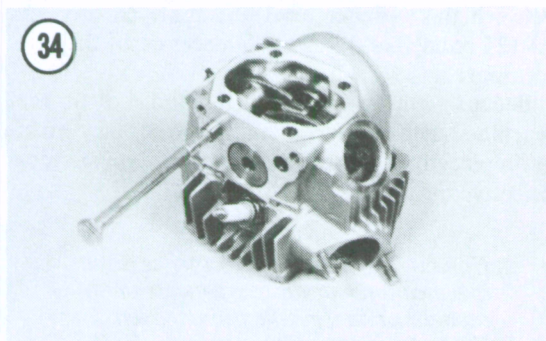
1. Remove all traces of gasket material from the cylinder head mating surfaces.
2. *Without removing the valves*, remove all carbon deposits from the combustion chamber and valve ports with a wire brush. A blunt screwdriver or chisel may be used if care is taken not to damage the head, valves and spark plug threads.
3. After the carbon is removed from the combustion chamber and the valve intake and exhaust ports, clean the entire head in cleaning solvent. Blow dry with compressed air.
4. Clean away all carbon from the piston crown. Do not remove the carbon ridge at the top of the cylinder bore.
5. Check for cracks in the combustion chamber and exhaust ports. A cracked head must be replaced.
6. After the head has been thoroughly cleaned, place a straightedge across the cylinder head/cylinder gasket surface (Figure 32) at several points. Measure the warp by inserting a flat feeler gauge between the straightedge and the cylinder head at each location. There should be no warp; if a small amount is present, the head can be resurfaced by a dealer or qualified machine shop.
7. Inspect the valves, valve springs and valve guides as described in this chapter.

#### NOTE

*Both intake and exhaust rocker arms and rocker arm shafts are identical (same Honda part numbers) when new but after prolonged mileage do wear differently. If you remove both rocker arm assemblies at the same time, mark them in sets with "I" (intake—top) or "E" (exhaust—bottom) so they will be reinstalled in the correct location in the cylinder head.*

8. Remove the screws securing the rocker arm shaft set plate (Figure 33) and remove the set plate and gasket.





### NOTE

*One of the engine mounting bolts can be used for the next step.*

9A. On 70 cc engines, screw in an 8 mm bolt (Figure 34) and withdraw the rocker arm shaft.

9B. On 90-125 cc engines, tap on the side of the cylinder head next to the rocker arm shafts with a plastic mallet and the rocker arm shafts will work their way out of the cylinder head. Remove the rocker arm shaft.

10. Remove the rocker arm.

11. Wash all parts in cleaning solvent and thoroughly dry.

12. Inspect the rocker arm pad (Figure 35) where it rides on the cam lobe and where the adjuster rides on the valve stem. If the pad is scratched or unevenly worn, inspect the cam lobe for scoring, chipping or flat spots. Replace the rocker arm if defective.

13. Measure the inside diameter of the rocker arm bore (A, Figure 36) with an inside micrometer and check against the dimensions in Table 1. Replace if worn to the service limit or greater.

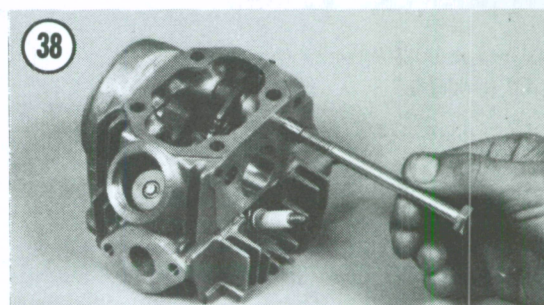
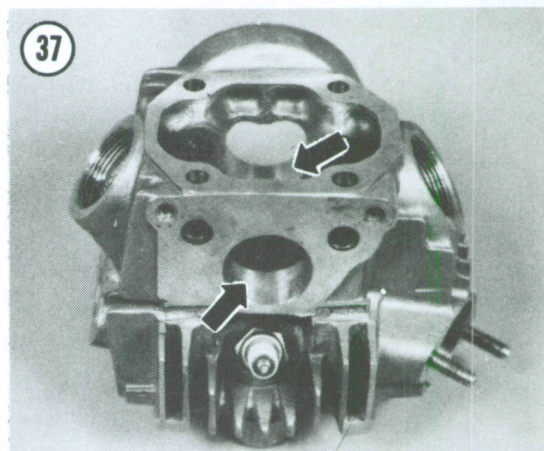
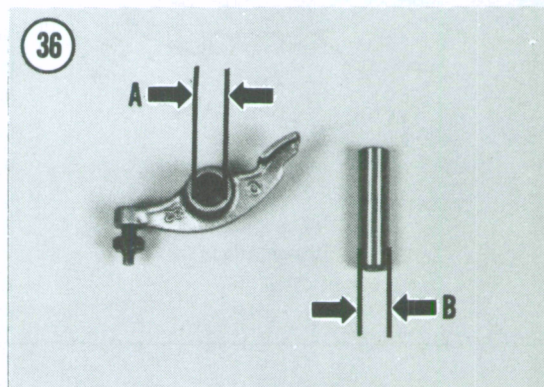
14. Inspect the rocker arm shaft for signs of wear or scoring. Measure the outside diameter (B, Figure 36) with a micrometer and check against the dimensions in Table 1. Replace if worn to the service limit or less.

15. Inspect the cam bearing surfaces (Figure 37) for excessive wear. If worn excessively, the cylinder head must be replaced.

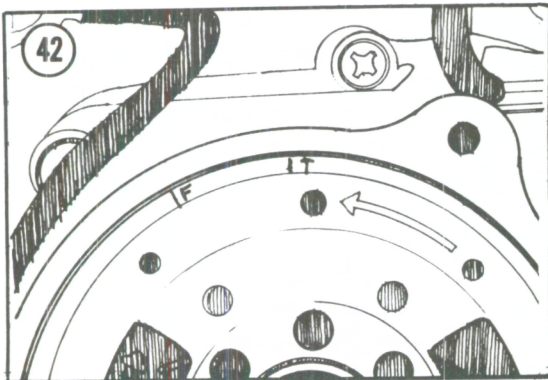
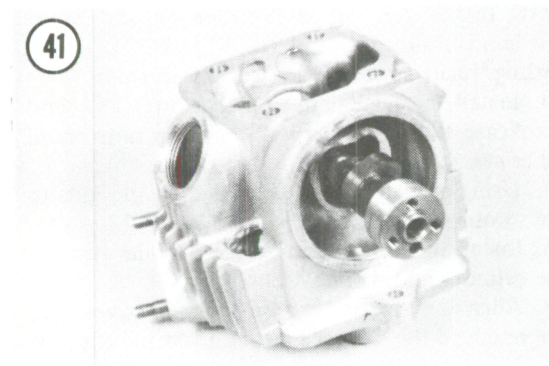
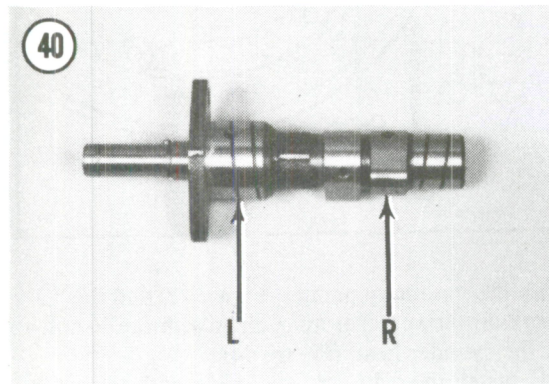
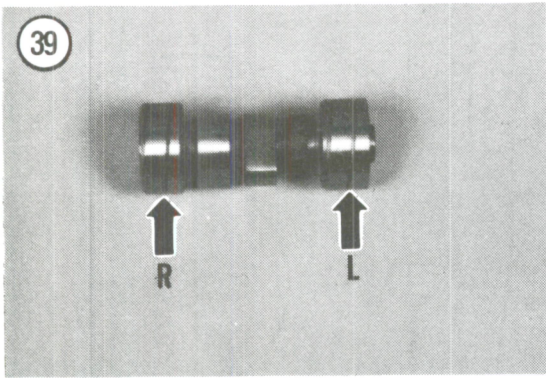
16. Coat the rocker arm shaft and rocker arm bore with assembly oil.

17A. On 70 cc engines, install the rocker arm shaft with the threaded hole facing out. Partially insert the rocker arm shaft into the cylinder head and position the rocker arm into the cylinder head (Figure 38).

17B. On 90-125 cc engines, the rocker arm shaft can be inserted in either direction. Partially insert the rocker arm shaft into the cylinder head and position the rocker arm into the cylinder head.







18. Repeat Steps 8-17 for the other rocker arm assembly.

19. Install the rocker arm shaft set plate and tighten the screws securely.

20. Check the cam bearing journals for wear and scoring. Measure both the left-hand (L) and right-hand (R) bearing journals with a micrometer. Refer to **Figure 39** for 70 cc engines or **Figure 40** for 90-125 cc engines. Compare to the dimensions given in **Table 1**. If worn to the service limit or greater, the cam must be replaced.

21. Check the cam lobes for wear. The lobes should show no signs of scoring and the edges should be square. Slight damage may be removed with a silicone carbide oilstone. Use No. 100-120 grit stone initially, then polish with a No. 280-320 grit stone.

22. Even though the cam lobe surface appears to be satisfactory with no visible signs of wear, the cam lobes must be measured with a micrometer. Compare to the dimensions given in **Table 1**.

23. Inspect the cam sprocket for wear; replace if necessary.

#### Installation (70 cc Engines)

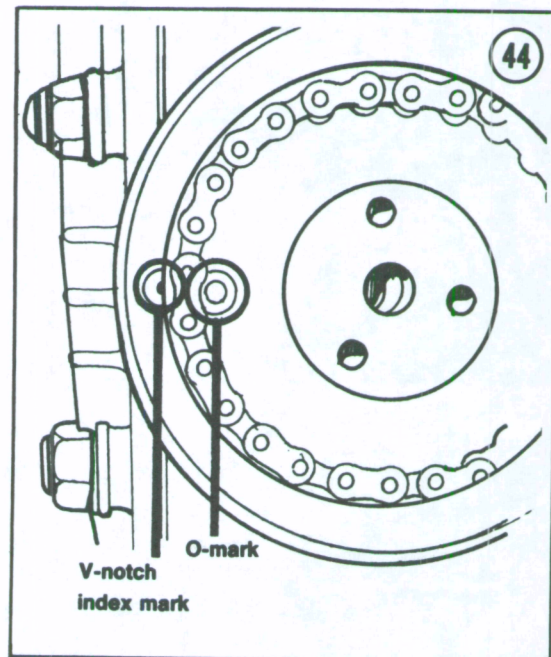
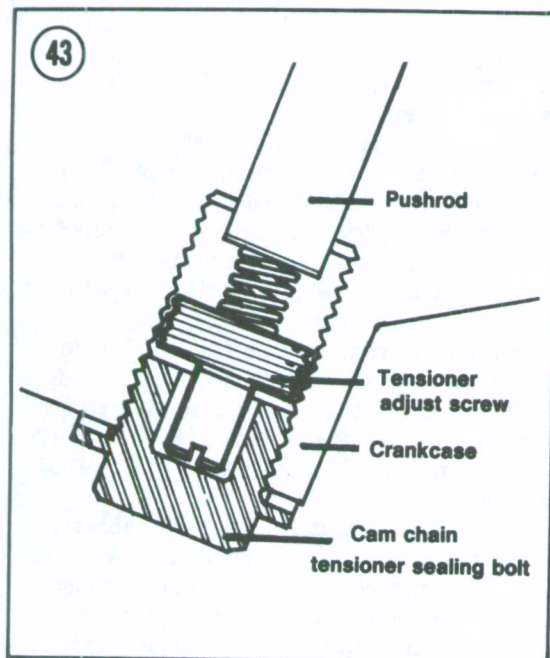
1. Lubricate the cam lobes and the bearing journals with molybdenum disulfide grease. Also coat the cam bearing surfaces in the cylinder head. Install the cam into the cylinder head (**Figure 41**) with the threaded holes for the cam sprocket facing out.

#### CAUTION

*When rotating the crankshaft, keep the cam chain taut and engaged with the timing sprocket on the crankshaft.*

2. Remove the recoil starter as described in Chapter Seven.
3. The engine must be at top dead center (TDC) during the following steps for correct valve timing. Hold the cam drive chain taut while rotating the crankshaft to avoid damage to the chain and/or the crankcase.
4. Rotate the crankshaft with the nut on the alternator rotor *counterclockwise* until the "T" timing mark is aligned with the fixed pointer on the crankcase (**Figure 42**).
5. Loosen the cam chain tensioner locknut and loosen the adjusting screw. Remove the cam chain tensioner sealing bolt (**Figure 43**) and loosen the tensioner adjust screw until it is almost unscrewed from the crankcase. This is to gain the maximum amount of cam chain slack.
6. Install a new head gasket and locating dowels.





7. If removed, install the cam sprocket (with the "O" mark facing out) onto the cam chain in the following manner. Hold the cam sprocket and cam chain straight out in line with the crankcase studs. Place the sprocket with the alignment mark "O" on the center top end of the cam chain. Let the cam sprocket and cam chain swing down and rest on the cylinder.

8. Install the cylinder head onto the crankcase studs. With your fingers, carefully insert the cam sprocket and cam chain into the cam chain cavity on the side of the cylinder head while pushing the cylinder head down into position.

9. Insert a screwdriver or drift into the hole in the cam sprocket and cam to hold the assembly in place.

10. Check the alignment of the cam sprocket. Make sure that the "O" mark is aligned with the V-notch index mark on the cylinder head (Figure 44). If alignment is not correct, reposition the cam chain on the sprocket so alignment is correct.

#### CAUTION

*Very expensive damage could result from improper cam and chain alignment. Recheck your work several times to be sure alignment is correct.*

11. When alignment is correct, install the cam sprocket bolts (Figure 16) and tighten to the torque specifications listed in Table 2.

12. Make one final check to make sure alignment is correct. The "T" timing mark must be aligned

with the stationary pointer (Figure 42) and the "O" mark on the sprocket must align with the V-notch in the cylinder head (Figure 44).

13. Install the cylinder head cover with the arrow (A, Figure 17) facing down toward the exhaust port. Install the copper washer on the lower left-hand crankcase stud (B, Figure 17). Install sealing washers on all other crankcase studs.

14. Install the regular nut on the lower left-hand crankcase stud (B, Figure 17) and cap nuts on all other crankcase studs.

15. Using a crisscross pattern, tighten the nuts to the torque specifications listed in Table 2.

16. Install the screw securing the cylinder head to the cylinder and tighten securely.

17. Align the locating tab on the side cover with the notch in the cylinder head and install the side cover with a new gasket. Install the long bolt from the right-hand side, screw it into the side cover and tighten securely.

18. Install the recoil starter, fuel tank and seat/rear fender assembly.

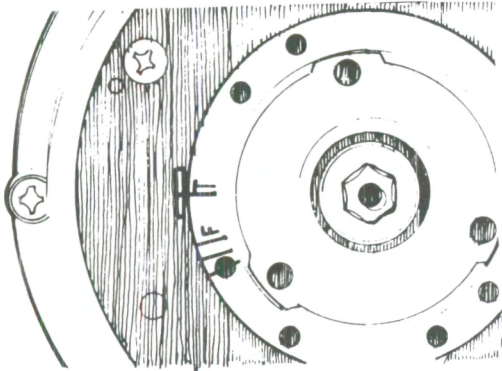
19. Adjust the valves and the cam chain tension as described in Chapter Three.

#### Installation (90-125 cc Engines)

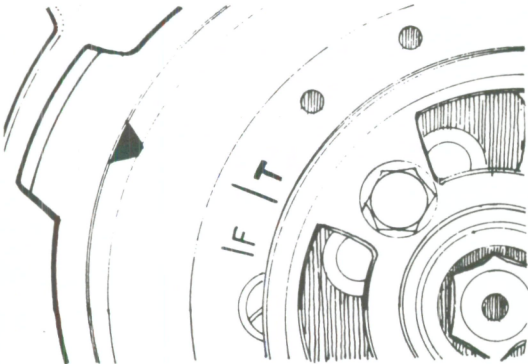
1. Lubricate all cam lobes and bearing journals with molybdenum disulfide grease. Also coat the cam bearing surfaces in the cylinder head.



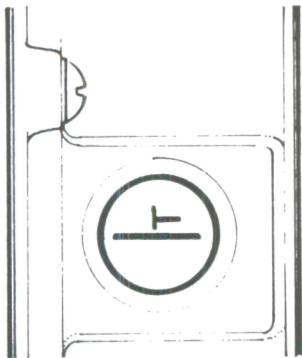
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ATC90

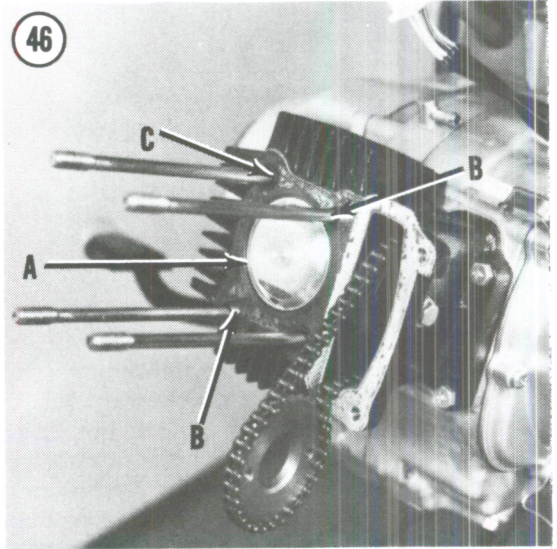


1979-1980 ATC110



1981-ON ATC110, ATC125M

46

**CAUTION**

*When rotating the crankshaft, keep the cam chain taut and engaged with the timing sprocket on the crankshaft.*

2. The engine must be at top dead center (TDC) during the following steps for correct valve timing. Hold the cam drive chain out and taut while rotating the crankshaft to avoid damage to the chain and/or the crankcase.
3. Remove the recoil starter as described in Chapter Seven.
4. Rotate the crankshaft with the nut or bolt on the alternator rotor. Turn it *counterclockwise* until the "T" timing mark is aligned with the fixed pointer either on the crankcase or alternator stator assembly (Figure 45).
5. Loosen the cam chain tensioner locknut and loosen the adjusting screw. Remove the cam chain tensioner sealing bolt (Figure 43) and loosen the tensioner adjust screw until it is almost unscrewed from the crankcase. This is to gain the maximum amount of cam chain slack.
6. Install a new head gasket (A, Figure 46), locating dowels (B, Figure 46) and O-ring seal (C, Figure 46).
7. If removed, install the cam sprocket (with the "O" mark facing out) onto the cam chain in the following manner. Hold the cam chain straight out in line with the crankcase studs. Place the sprocket "O" mark on the center top end of the cam chain. Let the cam sprocket and cam chain swing down and rest on the cylinder.
8. Install the cylinder head onto the crankcase studs. With your fingers, carefully insert the cam



sprocket and cam chain into the cam chain cavity on the side of the cylinder head while pushing the cylinder head down into position.

9. Insert a screwdriver or drift into the hole in the cam sprocket to hold the sprocket in place.

10. Loosen all valve adjusters fully. This is to allow maximum room for the cam during installation.

11. Position the cam with the lobes facing toward the crankcase and the dowel pin hole facing forward toward the top of the cylinder head.

12. Hold onto the cam sprocket, remove the screwdriver and install the cam through the cam sprocket and into position in the cylinder head.

13. Check the alignment of the cam sprocket. Make sure that the "O" mark is aligned with the V-notch index mark on the cylinder head (**Figure 44**). If alignment is not correct, reposition the cam chain on the sprocket so alignment is correct.

#### CAUTION

*Very expensive damage could result from improper cam and chain alignment. Recheck your work several times to be sure alignment is correct.*

14. When alignment is correct, install the cam sprocket bolts (B, **Figure 29**) and tighten to the torque specifications listed in **Table 2**.

15. Make one final check to make sure alignment is correct. The "T" timing mark must be aligned with the stationary pointer (**Figure 45**) and the "O" mark on the sprocket must align with the V-notch in the cylinder head (**Figure 44**).

16. Install the cylinder head cover. The cover can be installed in one direction only as the crankcase studs are offset.

#### NOTE

*In the next 2 steps, install the copper washer(s) and cap nut(s) in the same location from which they were removed. Refer to Step 14, **Removal**.*

17. Install the copper washer(s) and sealing washers on the crankcase studs in the correct location.

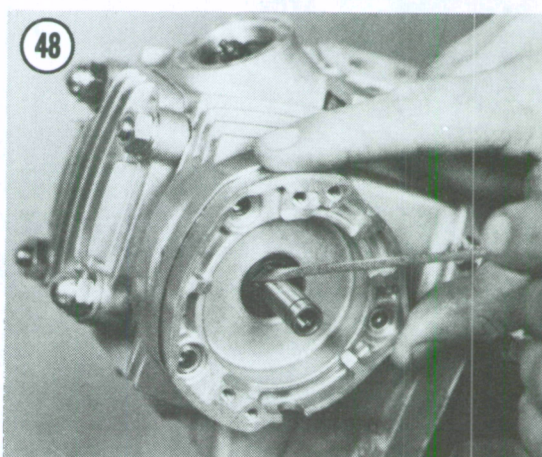
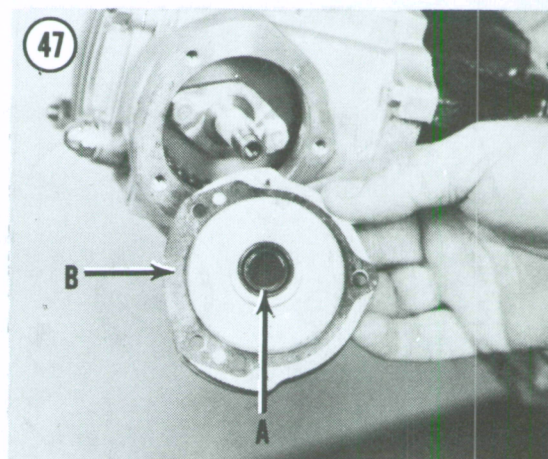
18. Install the cap nuts and regular nuts on the crankcase studs in the correct location.

19. Using a crisscross pattern, tighten the nuts to the torque specification listed in **Table 2**.

20. On ATC125M models, install the screws securing the cylinder head to the cylinder and tighten securely.

#### CAUTION

*Be careful when installing the base in the next step. The shoulder on the cam is very sharp and tends to turn the oil*



*seal (A, **Figure 47**) inside out. This oil seal has an internal circle spring that may pop out if the oil seal is turned inside out. Be sure to reinstall the spring in the seal if it comes out. As you slowly push the base into place, **carefully** work the seal over the shoulder of the cam with a narrow bladed screwdriver (**Figure 48**).*

21. Make sure the base gasket (B, **Figure 47**) is in place and install the contact breaker point base or CDI pulse generator base. Tighten the screws securely.

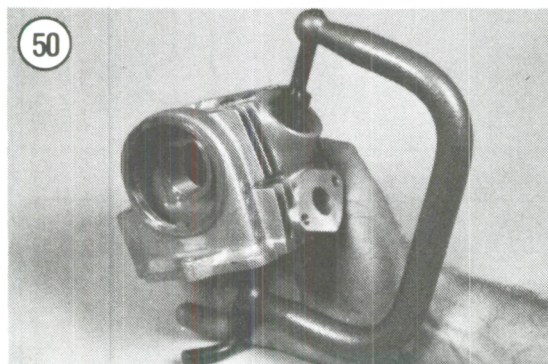
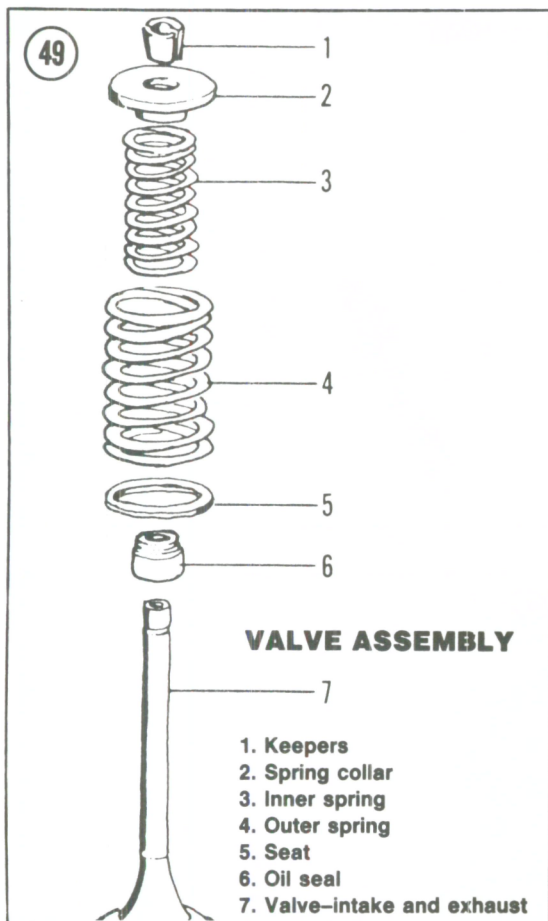
22. Install the dowel pin into the camshaft.

23. Install the ignition advance mechanism. Install the bolt and tighten it securely.

24. Connect the electrical connector to the contact breaker point assembly or CDI pulse generator assembly.

25. Install the ignition cover and gasket and tighten the screws securely.



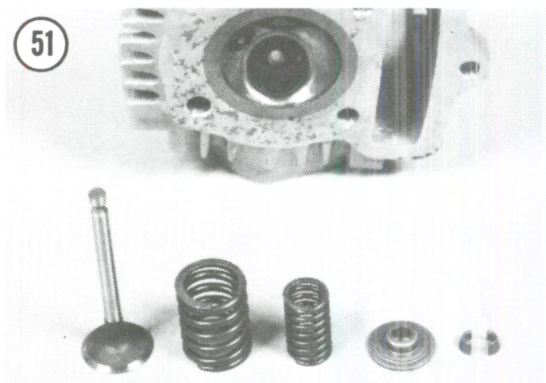


26. Install the recoil starter, fuel tank and seat/rear fender assembly.
27. Adjust the valves and cam chain tension as described in Chapter Three.

## VALVES AND VALVE COMPONENTS

### Removal

Refer to **Figure 49** for this procedure.



### CAUTION

When replacing valve parts on 1981 to mid-year 1984 ATC110 models, refer to **Cylinder Head and Camshaft Removal (90-125 cc)** regarding a special set of valve components that may have been installed on these models. Do **not** mix old valve parts with parts from a new valve kit that may have been installed by a Honda dealer. There are 2 punch marks on the top surface of the valve spring retainers in the **new** kit. All ATCs that have the new valve kit are identified by an "X" mark stamped directly under the engine serial number on the crankcase.

1. Remove the cylinder head as described in this chapter.
2. Compress the valve springs with a valve compressor tool (**Figure 50**). Remove the valve keepers and release the compression. Remove the valve compressor tool.

### CAUTION

To avoid loss of spring tension, do not compress the springs any more than necessary to remove the keepers.

3. Remove the valve spring retainer and valve springs (**Figure 51**). Do not intermix the springs as the intake valve springs are different than those on the exhaust valve.

### NOTE

The inner and outer valve seats and valve stem seal will stay in the cylinder head. On some models there is only an inner valve seat on the exhaust valve.

4. Prior to removing the valve, remove any burrs from the valve stem (**Figure 52**). Otherwise the valve guide will be damaged.
5. Mark all parts as they are disassembled so that they will be installed in their original location.



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